

Indonesian Journal of Electrical Engineering and Computer Science  
Volume 12, Issue 2, November 2018, Pages 722-728

On the use of edge features and exponential decaying number of nodes in the hidden layers for handwritten signature recognition (Article)

Gunawan, T.S.<sup>a</sup> ✉, Kartiwi, M.<sup>b</sup> 👤

<sup>a</sup>Electrical and Computer Engineering Department, International Islamic University Malaysia, Malaysia  
<sup>b</sup>Information Systems Department, Kuliyyah of Information and Communication Technology, International Islamic University Malaysia, Jalan Gombak, Kuala Lumpur, 53100, Malaysia

Abstract View references (14)

Handwritten signatures are playing an important role in finance, banking and education and more because it is considered the “seal of approval” and remains the most preferred means of authentication. In this paper, an offline handwritten signature authentication algorithm is proposed using the edge features and deep feedforward neural network (DFNN). The number of hidden layers in DFNN is configured to be at least one layer and more. In this paper, an exponential decaying number of nodes in the hidden layers was proposed to achieve better recognition rate with reasonable training time. Of the six edge algorithms evaluated, Roberts operator and Canny edge detectors were found to produce better recognition rate. Results showed that the proposed exponential decaying number of nodes in the hidden layers outperform other structure. However, more training data was required so that the proposed DFNN structure could have more efficient learning. © 2018 Institute of Advanced Engineering and Science. All rights reserved.

Author keywords

Deep feedforward neural network

Edge detection

Exponential decaying

Hidden layers

Offline handwritten signature

Funding details			
Funding number	Funding sponsor	Acronym	Funding opportunities
RIGS15-070-0070	International Islamic University Malaysia	IIUM	
	International Islamic University Malaysia	IIUM	
Funding text			
The researchers in this study would like to acknowledge the International Islamic University Malaysia (IIUM) for the financial funding of this research through the Research Initiatives Grant Scheme (RIGS) RIGS15-070-0070.			

ISSN: 25024752  
Source Type: Journal  
Original language: English

DOI: 10.11591/ijeecs.v12.i2.pp722-728  
Document Type: Article  
Publisher: Institute of Advanced Engineering and Science


Metrics ⓘ

0

Citations in Scopus

0

Field-Weighted Citation Impact

 PlumX Metrics ▼

Usage, Captures, Mentions, Social Media and Citations beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert >

Set citation feed >

Related documents

Development of offline handwritten signature authentication using artificial neural network

Gunawan, T.S. , Mahamud, N. , Kartiwi, M. (2018) 3rd International Conference on Computing, Engineering, and Design, ICCED 2017

Modeling fabric hand of a textile process using a multilayer perceptron pruning algorithm

Feki, I. , Msahli, F. , Zeng, X. (2016) Uncertainty Modelling in Knowledge Engineering and Decision Making - Proceedings of the 12th International FLINS Conference, FLINS 2016

Handwritten signature recognition and verification using artificial neural network

Roy, A. , Dutta, S. , Das, M. (2017) Computer, Communication and Electrical Technology - Proceedings of the International Conference on

- ☐ 1 Beatrice, D., Thomas, H.  
 (2015) *On-Line Handwritten Signature Verification Using Machine Learning Techniques with a Deep Learning Approach*. Cited 2 times.  
 Master's Theses in Math," Sciences, Lund University

View all related documents based on references

Find more related documents in Scopus based on:

Authors > Keywords >

- ☐ 2 Abushariah, A.A.M., Gunawan, T.S., Chebil, J., Abushariah, M.A.M.  
**Automatic person identification system using handwritten signatures**  
  
 (2012) *2012 International Conference on Computer and Communication Engineering, ICCCE 2012*, art. no. 6271249, pp. 560-565. Cited 7 times.  
 ISBN: 978-146730478-8  
 doi: 10.1109/ICCCE.2012.6271249  
  
[View at Publisher](#)

- ☐ 3 Nassi, B., Levy, A., Elovici, Y., Shmueli, E.  
 (2016) *Handwritten Signature Verification Using Hand-Worn Devices*. Cited 5 times.  
 arXiv preprint arXiv

- ☐ 4 Neamah, K., Mohamad, D., Saba, T., Rehman, A.  
**Discriminative Features Mining for Offline Handwritten Signature Verification**  
  
 (2014) *3D Research*, 5 (1), pp. 1-6. Cited 41 times.  
<http://www.springer.com/engineering/signals/journal/13319>  
 doi: 10.1007/s13319-013-0002-3  
  
[View at Publisher](#)

- ☐ 5 Maji, P., Chakraborty, S., Samanta, S., Chatterjee, S., Kausar, N., Dey, N.  
**Effect of euler number as a feature in gender recognition system from offline handwritten signature using neural networks**  
  
 (2015) *2015 International Conference on Computing for Sustainable Global Development, INDIACom 2015*, art. no. 7100569, pp. 1869-1873. Cited 11 times.  
 ISBN: 978-938054416-8

- ☐ 6 Guerbai, Y., Chibani, Y., Hadjadji, B.  
**The effective use of the one-class SVM classifier for handwritten signature verification based on writer-independent parameters**  
  
 (2015) *Pattern Recognition*, 48 (1), pp. 103-113. Cited 53 times.  
[www.elsevier.com/inca/publications/store/3/2/8/](http://www.elsevier.com/inca/publications/store/3/2/8/)  
 doi: 10.1016/j.patcog.2014.07.016  
  
[View at Publisher](#)

- ☐ 7 Pansare, A., Bhatia, S.  
 Handwritten signature verification using neural network  
 (2012) *International Journal of Applied Information Systems*, 1, pp. 44-49. Cited 14 times.